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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,140	05/03/2006	Chang Hae Kim	3449-0620PUS1	8843

2292 7590 02/06/2009

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EXAMINER	
BOWMAN, MARY ELLEN	

ART UNIT	PAPER NUMBER
2879	

NOTIFICATION DATE	DELIVERY MODE
02/06/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/578,140	KIM ET AL.	
	Examiner	Art Unit	
	MARY ELLEN BOWMAN	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6-24 and 30-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-24 and 30-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/17/08, 11/5/08, 11/24/08, 1/15/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments, filed October 17, 2008, with respect to the rejection(s) of claim(s) 1-3, 6-24 and 30-33 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Maeda et al., USP App. Pub. No. 2004/0104391 A1, published June 3, 2004 (hereinafter referred to as "Maeda").

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

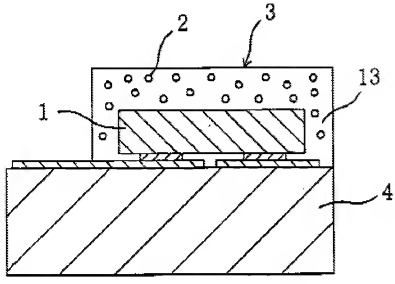
Claims 1-3, 6-24 and 30-33 are rejected under 35 U.S.C. 102 (b) as being anticipated by Maeda et al., USP App. Pub. No. 2004/0104391 A1, published June 3, 2004 (hereinafter referred to as "Maeda").

Regarding claim 1, Maeda teaches **a phosphor having the chemical formula: $Sr_{4-x}Mg_yBa_zSi_2O_8:Eu^{2+}_x$ ($0<x<1$, $0\leq y\leq 1$, $0\leq z\leq 1$)** ([0450]; "a $(Sr_{0.98-a3}Ba_{a3}Eu_{0.02})_2SiO_4$ silicate phosphor having the composition range…$0.01<a3\leq 0.3$ is a yellow/yellowish phosphor having a main emission peak in the wavelength range from 550 nm to 600 nm"; Note: The above listed phosphor satisfies the claimed equation within an experimental margin of error of ±0.1, if the equation is multiplied by 2, which does not alter the relative amounts of the constituent parts of the phosphor with respect to each other. The resultant formula would be, $Sr_{3.92-x-a3-}$

$_xBa_{a3}Si_2O_8:Eu_x^{2+}$, wherein 0.04<a3≤1.2 and 0.04≤x≤0.2 [see [0447]), **wherein the phosphor is excited by the light having a main peak ranging from 400 to 480 nm, the phosphor has a main emission peak ranging from 500 to 600 nm** ([0421]; "silicate phosphor is a phosphor which can emit…green…light when excited by at least blue light with a main emission peak wavelength of 470 nm…and which has a main emission peak wavelength in the range from 505 nm to 598 nm").

Regarding claim 8, Maeda teaches **a light emitting device including a phosphor** (Figure 1 below), **comprising: a light source** (LED 1); **a support for supporting the light source** (substrate 4); **a light transmitting member provided at least one portion around the light source** (translucent resin 13); **and a phosphor having the chemical formula: $Sr_{4-x}Mg_yBa_zSi_2O_8:Eu^{2+}_x$ (0<x<1, 0≤y≤1, 0≤z≤1)** ([0450]; "a $(Sr_{0.98-a3}Ba_{a3}Eu_{0.02})_2SiO_4$ silicate phosphor having the composition range…0.01<a3≤0.3 is a yellow/yellowish phosphor having a main emission peak in the wavelength range from 550 nm to 600 nm"; Note: The above listed phosphor satisfies the claimed equation within an experimental margin of error of ±0.1, if the equation is multiplied by 2, which does not alter the relative amounts of the constituent parts of the phosphor with respect to each other. The resultant formula would be, $Sr_{3.92-x-a3-x}Ba_{a3}Si_2O_8:Eu_x^{2+}$, wherein 0.04<a3≤1.2 and 0.04≤x≤0.2 [see [0447]), **wherein the phosphor is excited by the light having a main peak ranging from 400 to 480 nm, the phosphor has a main emission peak ranging from 500 to 600 nm** ([0421]; "silicate phosphor is a phosphor which can emit…green…light when excited by at least blue light with a main emission peak wavelength of 470 nm…and which has a main emission peak wavelength in the range from 505 nm to 598 nm").

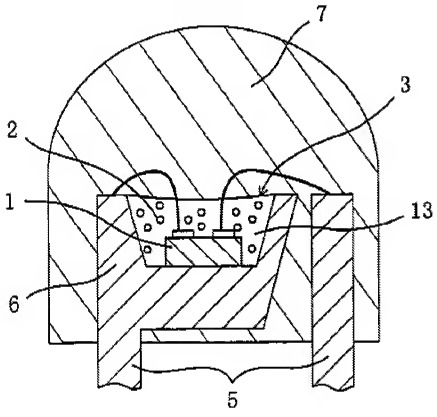
FIG. 1



Regarding claim 23, Maeda teaches **a lamp type** (see Figure 2 below) **light emitting device including a phosphor** (phosphor 2), **comprising: a light source** (LED 1)**; a support for supporting the light source** (cup 6)**; a molding member provided at at least one portion around the light source** (translucent resin 13)**; and a phosphor having the chemical formula:** $Sr_{4-x}Mg_yBa_zSi_2O_8:Eu^{2+}{}_x$ **(0<x<1, 0≤y≤1, 0≤z≤1)** ([0450]; "a $(Sr_{0.98-a3}Ba_{a3}Eu_{0.02})_2SiO_4$ silicate phosphor having the composition range…0.01<a3≤0.3 is a yellow/yellowish phosphor having a main emission peak in the wavelength range from 550 nm to 600 nm"; Note: The above listed phosphor satisfies the claimed equation within an experimental margin of error of ±0.1, if the equation is multiplied by 2, which does not alter the relative amounts of the constituent parts of the phosphor with respect to each other. The resultant formula would be, $Sr_{3.92-x-a3-}{}_xBa_{a3}Si_2O_8:Eu_x{}^{2+}$, wherein 0.04<a3≤1.2 and 0.04≤x≤0.2 [see [0447])**, wherein the phosphor is excited by the light having a main peak ranging from 400 to 480 nm, the phosphor has a**

main emission peak ranging from 500 to 600 nm ([0421]; "silicate phosphor is a phosphor which can emit…green…light when excited by at least blue light with a main emission peak wavelength of 470 nm…and which has a main emission peak wavelength in the range from 505 nm to 598 nm").

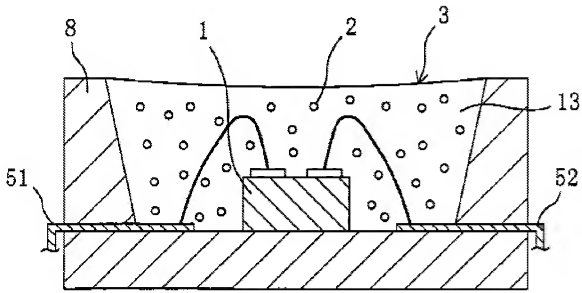
FIG. 2



Regarding claim 24, Maeda teaches **a surface mounting type** (see Figure 3 below) **light emitting device including a phosphor** (phosphor 2)**, comprising: a light source** (LED 1)**; a support for supporting the light source** (case 8)**; a molding member provided at least one portion around the light source** (translucent resin 13)**; and a phosphor having the chemical formula:** $Sr_{4-x}Mg_yBa_zSi_2O_8:Eu^{2+}_x$ **(0<x<1, 0≤y≤1, 0≤z≤1)** ([0450]; "a $(Sr_{0.98-a3}Ba_{a3}Eu_{0.02})_2SiO_4$

silicate phosphor having the composition range…0.01<a3≤0.3 is a yellow/yellowish phosphor having a main emission peak in the wavelength range from 550 nm to 600 nm"; Note: The above listed phosphor satisfies the claimed equation within an experimental margin of error of ±0.1, if the equation is multiplied by 2, which does not alter the relative amounts of the constituent parts of the phosphor with respect to each other. The resultant formula would be, $Sr_{3.92-x-a3-x}Ba_{a3}Si_2O_8:Eu_x^{2+}$, wherein 0.04<a3≤1.2 and 0.04≤x≤0.2 [see [0447]), **wherein the phosphor is excited by the light having a main peak ranging from 400 to 480 nm, the phosphor has a main emission peak ranging from 500 to 600 nm** ([0421]; "silicate phosphor is a phosphor which can emit…green…light when excited by at least blue light with a main emission peak wavelength of 470 nm…and which has a main emission peak wavelength in the range from 505 nm to 598 nm")**.**

FIG. 3

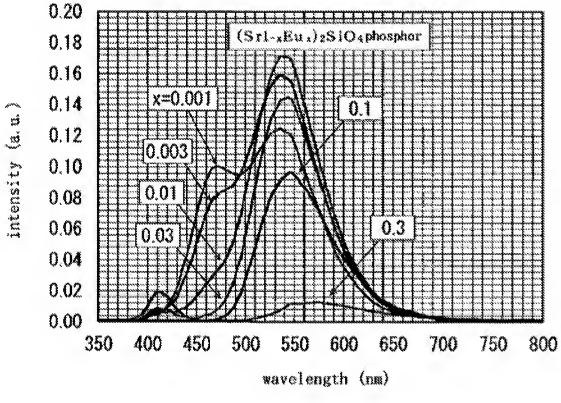


Regarding claim 2, Maeda teaches the invention as explained above regarding claim 1, and further teaches **the average particle size is less than 20 μm** ([0204]; "particle size preferably ranges from…2 μm to 10 μm").

Regarding claim 3, Maeda teaches the invention as explained above regarding claim 1, and further teaches **the average particle size of the phosphor is 5 to 15 μm** ([0204]; "particle size preferably ranges from…2 μm to 10 μm").

Regarding claim 6, Maeda teaches the invention as explained above regarding claim 1, and further teaches **a main emission peak of the phosphor shifts according to the concentration of Eu^{2+}** (Figure 40 below).

FIG. 40



Regarding claims 7, 9 and 15, Maeda teaches the inventions as explained above regarding claims 1 and 8, and further teaches **the mole concentration of Eu^{2+} is 0.02 to 0.20 mol** ([0448]; "Eu mole fraction…is in the practical range from 0.001 to 0.03, both inclusive [Note: Range must be multiplied by 2 according to the explanation of claims 1 and 8 above, therefore, the mole concentration of Eu is 0.002 to 0.06, which is within the claimed range).

Regarding claim 10, Maeda teaches the invention as explained above regarding claim 8, and further teaches **the light transmitting member is a molding member** (translucent resin 13).

Regarding claim 11, Maeda teaches the invention as explained above regarding claim 8, and further teaches **the mixing ratio of the phosphor with respect to the light transmitting member is 5 to 50 wt%** ([0228]; "the weight percentage of…phosphor particles 2 with respect to the base materials 13…is preferably…in the range from 20 wt% to 60 wt%, both inclusive").

Regarding claim 12, Maeda teaches the invention as explained above regarding claim 8, and further teaches **the light transmitting member is molded entirely around the light emitting device** (Figure 1 above).

Regarding claim 13, Maeda teaches the invention as explained above regarding claim 8, and further teaches **the light transmitting member is molded partially around the light emitting device** (Figure 3 above).

Regarding claim 14, Maeda teaches the invention as explained above regarding claim 8, and further teaches **white light is emitted by combining the light emitted from the light source and the light excited by the phosphor** ([0046]).

Regarding claim 16, Maeda teaches the invention as explained above regarding claim 8, and further teaches **the light emitting device is a top view type** (see Figure 3 above), **the**

concentration of Eu^{2+} is 0.02 to 0.10 mol ([0448]; "Eu mole fraction…is in the practical range from 0.001 to 0.03, both inclusive [Note: Range must be multiplied by 2 according to the explanation of claims 1 and 8 above, therefore, the mole concentration of Eu is 0.002 to 0.06, which is within the claimed range).

Regarding claim 17, Maeda teaches the invention as explained above regarding claim 16, and further teaches **the content of the phosphor with respect to the light transmitting member is 10 to 30 wt%** ([0228]; "the weight percentage of…phosphor particles 2 with respect to the base materials 13…is preferably…in the range from 20 wt% to 60 wt%, both inclusive").

Regarding claim 18, Maeda teaches the invention as explained above regarding claim 8, and further teaches **the light emitting device is a side view type** ([0377]), **the concentration of Eu^{2+} is 0.08 to 0.15 mol** ([0451]; "Eu mole fraction…in the range from 0.001 to 0.3, both inclusive [Note: Range must be multiplied by 2 according to the explanation of claims 1 and 8 above, therefore, the mole concentration of Eu is 0.002 to 0.6, which is within the claimed range)

Regarding claim 19, Maeda teaches the invention as explained above regarding claim 18, and further teaches **the content of the phosphor with respect to the light transmitting member is 5 to 20 wt%** ([0228]; "the weight percentage of…phosphor particles 2 with respect to the base materials 13…is preferably…in the range from 20 wt% to 60 wt%, both inclusive").

Regarding claim 20, Maeda teaches the invention as explained above regarding claim 8, and further teaches **the light emitting device is used as a white light source of a backlight** ([0017]), **the concentration of Eu^{2+} included in the phosphor is 0.02 to 0.10 mol** ([0448]; "Eu mole fraction…is in the practical range from 0.001 to 0.03, both inclusive [Note: Range must be multiplied by 2 according to the explanation of claims 1 and 8 above, therefore, the mole

concentration of Eu is 0.002 to 0.06, which is within the claimed range), **and the content of the phosphor with respect to the light transmitting member is 15 to 50 wt%** ([0228]; "the weight percentage of…phosphor particles 2 with respect to the base materials 13…is preferably…in the range from 20 wt% to 60 wt%, both inclusive").

Regarding claim 21, Maeda teaches the invention as explained above regarding claim 8, and further teaches **the light emitting device is used as a blue light source of a backlight** (Figure 32, phosphor can shift to emit within the blue light range, therefore the combination of the blue LED and the blue phosphor would create a blue light source), **the concentration of Eu^{2+} included in the phosphor is 0.02 to 0.10 mol** ([0448]; "Eu mole fraction…is in the practical range from 0.001 to 0.03, both inclusive [Note: Range must be multiplied by 2 according to the explanation of claims 1 and 8 above, therefore, the mole concentration of Eu is 0.002 to 0.06, which is within the claimed range), **and the content of the phosphor with respect to the light transmitting member is 10 to 40 wt%** ([0228]; "the weight percentage of…phosphor particles 2 with respect to the base materials 13…is preferably…in the range from 20 wt% to 60 wt%, both inclusive").

Regarding claim 22, Maeda teaches the invention as explained above regarding claim 8, and further teaches **the light source is a gallium nitride light emitting diode** ([0311]).

Regarding claims 30-33, Maeda teaches the inventions as explained above regarding claims 1, 8, 23 and 24 respectively, and further teaches **$0<z\leq 1$ such that the phosphor comprises barium (Ba) and the chemical formula is $Sr_{4-x}Mg_yBa_zSi_2O_8:Eu^{2+}_x$ ($0<x<1$, $0\leq y\leq 1$, $0<z\leq 1$)** ([0450]; "a $(Sr_{0.98-a3}Ba_{a3}Eu_{0.02})_2SiO_4$ silicate phosphor having the composition range…$0.01<a3\leq 0.3$ is a yellow/yellowish phosphor having a main emission peak in the

wavelength range from 550 nm to 600 nm"; Note: The above listed phosphor satisfies the claimed equation within an experimental margin of error of ±0.1, if the equation is multiplied by 2, which does not alter the relative amounts of the constituent parts of the phosphor with respect to each other. The resultant formula would be, $Sr_{3.92-x-a3-x}Ba_{a3}Si_2O_8:Eu_x^{2+}$, wherein $0.04<a3\leq 1.2$ and $0.04\leq x\leq 0.2$ [see [0447]; Further Note: a3 is equivalent to the claimed variable, z),

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARY ELLEN BOWMAN whose telephone number is (571) 270-5383. The examiner can normally be reached on Monday-Thursday, 7:30 a.m.-6:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 2879

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